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STUDIES ON A NEW GROUP FEATURE OF EEL ERYTHROCYTES – An(a)

BADANIA NAD NOWĄ CECHĄ GRUPOWĄ KRWINEK WĘGORZY – An(a)

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The authors showed that the bovine, pig and goat sera make a source of model agglutinins for determinations of a new group feature of eel erythrocytes An(a). The An(a) feature was found in 40,4% of eels out of 62 examined eel individuals from the Szwaderki Lake.

In our previous report (**Sagan** and **Felińska**, 1972) we have shown the erythrocytes taken from certain eels being strongly agglutinated with human and bovine sera, while the erythrocytes from other eels being egglutinated weakly or not at all. We have denoted these properties with a symbol of „An" derived from the specific name of eel – *Anguilla anguilla* L.

The group of eels showing a strong erythrocytes agglutination has been denoted as An (a); the group without any signs of agglutination or exhibiting only a weak one has been referred to as An (b); eels with erythrocytes showing intermediate properties have been grouped into an An (c) group.

Our present report demonstrates the results of studies on obtaining possibly strong and specific anti-An (a) sera and on the occurrence of the An (a) system within the eel population caught in October 1972 in the Szwaderki Lake (The Mazurian Lake District).

MATERIAL AND METHOD

Basically the methods described in the previous paper (**Sagan** and **Felińska**, 1972) were applied. In order to characterize a serum we have introduced an agglutinin activity index

expressed as a fraction. Its numerator represents a titration degree (The negative power from the denominator of a fraction indicating the maximal dilution with still noticeable agglutination; for example titration of $1/8 = 1/2^3$ is expressed as a titration degree of – 3). The fraction denominator indicates an agglutination score computed by addition of conventional numerical values of agglutination intensities in each dilution according to the following scale:
the agglutination intensity of ++++ (four plus signs) corresponds to the numerical value of 12; +++ (three plus signs) correspond to 9; ++ (two plus signs) correspond to 6; + (one plus sign) corresponds to 3; ± (signs of plus and minus) correspond to 1; - (minus sign marking lack of agglutination) correspond to 0.

The sera obtained from 19 pigs and 8 cows (from the Szczecin Town Slaughter-House) and 2 goats (from the Department of Physology, Academy of Agriculture) were subjected to the following procedure: each serum was being absorbed the erythrocytes eel group An (b) washed three times in 4°C during an hour, the proportions being adjusted volumetrically to four parts of a serum against one part of dense erythrocytes.

In order to denote the origin of an agglutinin the following indexes are given after the feature symbol: the first two letters of the English species name written below the symbol, for example the anti-An (a) serum of pig is given as Anti-An $(a)_{pi}$, the bovine one as anti-An $(a)_{bo}$, the goat one as anti-An $(a)_{go}$.

The goat sera were not exposed to the absorption. No 2 goat serum, after dilution to 1/4, showed an activity index of agglutination with the An (a) erythrocytes amounting to 2/4, whereas it did not agglutinate the An (b) erythrocytes.

RESULTS

1. The examination of the agglutination specificity of the An (a) eel erythrocytes to the pig, bovine and goat sera.

Table 1 contains the results of titrating the sera from 19 pigs and 2 goats with the An (a) and An (b) erythrocytes using the agglutination activity index.

The bovine and pig sera were absorbed with the An (b) erythrocytes in order to obtain the specific anti-An (a) agglutinins. The results obtained are given in Table 2.

2. Studies on the occurrence of the An (a) feature in 62 eels caught in October 1972 in the Szwaderki Lake.

No 2 goat serum in 1/4 dilution, No 17 pig serum and No 3 cow one were used, the last two undergoing the absorption. The results are presented in Table 3.

DISCUSSION

Data contained in Table 1 show that the pig and goat sera possess strong heteroagglutinins for the eel erythrocytes, a difference in their activity being marked through an agglutination of the An (a) erythrocytes stronger than that of the An (b) ones.

Tabela 1

The Serum Agglutinin Activity Index																				Erythrocyte group
Pig No																		Goat No		
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	1	2	
4/21	5/30	4/27	4/21	5/25	5/30	3/15	4/21	4/24	5/27	4/24	5/33	4/16	4/24	5/33	5/24	4/24	4/24	4/21	2/6	3/10	An(a)
4/12	5/19	4/18	2/9	3/18	4/24	2/6	2/9	3/10	3/12	3/12	3/9	1/3	1/3	3/12	3/12	4/16	3/12	3/15	2/4	1/3	An(b)

Tabela 2

The Absorbed Serum Agglutinin Activity Index															Erythrocyte group
Pig No								Cow No							
4	5	12	13	14	15	16	17	1	2	3	4	5	6	7	
4/21	5/25	4/21	4/16	4/21	5/27	4/19	5/22	5/22	1/3	4/21	2/4	3/18	1/3	4/21	An(a)
0/0	3/3	0/0	0/0	0/0	1/1	0/0	0/0	1/1	0/0	0/0	0/0	0/0	0/0	0/0	An(b)

Table 3

No	Agglutination with the anti-An(a) serum			Frequency of the reaction occurrence		An(a) feature	Remarks	Group
	Pig	Cow	Goat	no. of individ.	%	presence		
1	+++	+++	++	25	40,4	An(a+)	3 sera from various sources confirm the result	An(a)
2	–	–	–	27	43,6	An(a–)	–„–	An(b)
3	–	–	+	4	6,4	An(a–)?	Strong pig and bovine sera would prove a possible presence of the An(a) feature	
4	∓	∓	+	3	4,8	An(a+)?	Maybe a very weak An(a) feature	
5	+	+	–	2	3,2	An(a+)?	Maybe the stronger agglutinins detect a weak form of the An(a) feature	An(c)
6	+++	+++	–	1	1,6	An(a+)?	Inconformities of results found during summarization of tables; it was not possible to check the determinations	
			Total	62	100,0			

Table 2 points out the possibilty of demonstrating the strong specific anti-An (a) agglutinins after the pig and bovine sera absorption. The goat sera contained much weaker heteroagglutinins for the eel erythrocytes and their specificity was obtained through a sufficient dilution.

Table 3 shows the doubtless occurrence of the An (a) feature in 40,4% of eels, while 43,6% lack it. This fact could be possible to establish using 3 anti-An (a) sera of various origin, viz. the pig, bovine and goat sera. In the remaining cases (16%) no unequivocal results were obtained owing to the feature being less marked (Nos 4 and 5) or to some laboratory errors, impossible to be eliminated with a control examination because of the inconformities found during summarization of the results after some time and due to the erythrocytes haemolysis (No 6). The four cases giving the equivocal results (No 3) allow a suggestion that the model anti-An $(a)_{go}$ serum should have some additional agglutinins and this is what differentiates it from the anti-An $(a)_{pi}$ and anti-An $(a)_{bo}$ sera. Possible connections with the other biological features should be explained as far as the occurrence of the An (a) system group features are concerned. Such studies are now in progress.

REFERENCES

Sagan Z., Felińska C., 1972: Preliminary studies on blood groups of eels Anguilla anguilla (L.). Acta Ichtiol. Et Piscat.; II, 1! 63–68.

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BADANIA NA NOWĄ CECHĄ GRUPOWĄ KRWINEK WĘGORZY – An(a)

Streszczenie

Przeprowadzane badania wykazały, iż heteroaglutyniny dla krwinek węgorzy występujące w surowicach świńskich i bydlęcych po absorbcji mogą dać silne i swoiste aglutyniny, w oparciu o które można węgorze podzielić na grupę, której krwinki są silnie aglutynowane An(a) co stanowi 40,4% i grupę, której krwinki nie są aglutynowane An(b) co stanowi 43,6%. Swoistość aglutyniny anty-An(a) wykazuje również surowica kozy po odpowiednim rozcieńczeniu.

W 16% uzyskano wyniki niejednoznaczne – grupa An(c); wydaje się, że odpowiednie przygotowanie pracowni do badań przynależności grupowej w zakresie układu cech An zmniejszy tę grupę do minimum.

Sygnalizuje się podjęcie badań nad ewentualnymi związkami cech grupowych układu An z innymi cechami biologicznymi.

ИССЛЕДОВАНИЯ НОВОГО ГРУППОВОГО ПРИЗНАКА ЭРИТРОЦИТОВ УГРЯ - An(a)

Р е з ю м е

Проведенные исследования показали, что гетероагглютинины для кровяных телец угря, содержащиеся в сыворотках свиней и скота после абсорбции, могут дать сильные и характерные агглютинины, на основе которых можно разделить угрей на группу, кровяные тельца которой сильно агглютинированы - An(a), что составляет 40,4%, и группу, кровяные тельца которой не агглютинированы - An(b), что составляет 43,6%. Свойства агглютинина анти - An(a) проявляет также сыворотка козы после соответствующего разбавления.

В 16% получены неоднозначные результаты - группа An(c); думается, что соответствующая подготовка лаборатории для исследования групповой принадлежности в области системы признаков An уменьшит эту группу до минимума.

Сообщаем о начале исследований возможных связей групповых признаков системы An с другими биологическими признаками.

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